

Trend Study 14-31-04

Study site name: Chippean Ridge .

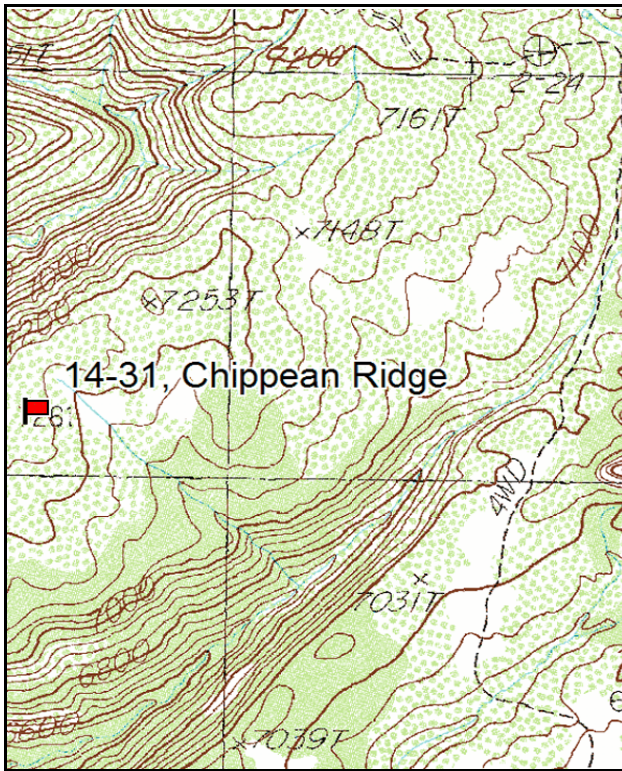
Vegetation type: Mixed Mountain Brush .

Compass bearing: frequency baseline 181 degrees magnetic.

Frequency belt placement: line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft).

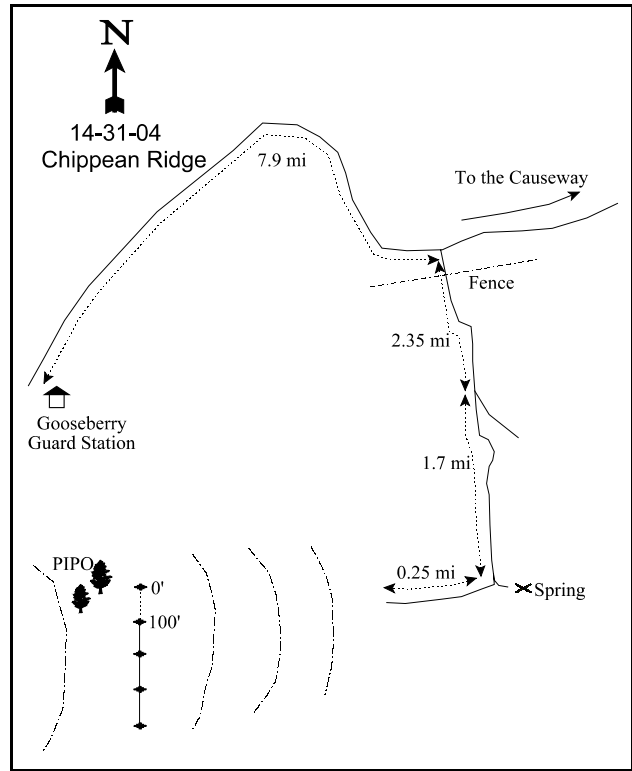
LOCATION DESCRIPTION

From the Gooseberry Guard Station go north and east towards ‘The Causeway’ for 7.9 miles to a fork. Turn right off the main road passing through a gate/fence shortly after the turn. Continue 2.35 miles to a fork and bear right. Drive 1.7 miles to another fork and turn right on a very faint overgrown road (left road ends about a 100 ft or so near a spring). Continue on another 0.25 miles to the end of the road. Continue to follow the old road or trail west at a slight rise in elevation about 2/3 of a mile to the third ridge. There are two Ponderosa pines 30 ft apart which are near the ridge's northern apex. The 0 ft baseline stake is 50 ft away from the lowermost, larger Ponderosa pine at a bearing of 60° M. The baseline is marked with half high steel fence posts.



Map Name: Chippean Rocks

Township 34S , Range 20E , Section 36



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4182120 N, 616539 E

## DISCUSSION

### Chippean Ridge - Trend Study No. 14-31

The Chippean Ridge study was initiated in 1992 because of elk use in this area during the winter and spring. It is a mountain brush community that is dominated by serviceberry and mountain big sagebrush on a 8% to 10% percent slope with a southern aspect. Elevation is approximately 7,200 feet. There are a few scattered ponderosa and pinyon pines throughout the study area, but further up the ridge, ponderosa and manzanita are the dominant species association. Point quarter data from 1999 estimated 29 juniper and 33 pinyon trees/acre. Average diameter of juniper is 8.5 inches, while that of pinyon is 5 inches.

The site is principally a elk winter/spring range. Several elk antler drops were found on site in 1992, but all appeared to be from the previous winter ('91). Pellet group data has only shown light use by elk. Pellet group data from 1999 estimated 7 deer days use/acre (17 ddu/ha), 24 elk days use/acre (59 edu/ha), and 4 cow days use/acre (10 cdu/ha). All cattle pats were from the previous year. Rabbit sign was abundant in 1999. Pellet group data from 2004 estimated 4 deer days use/acre (12 ddu/ha), 23 elk days use/acre (58 edu/ha), and 1 cow day use/acre (4 cdu/ha).

The soil on the site is deep and compacted with an estimated effective rooting depth of nearly 25 inches. It has a sandy clay loam texture with a neutral pH (7.2). Phosphorus is limited on the site at only 4.1 ppm. Values less than 10 ppm may limit normal plant growth and development. Parent material is sandstone and the soil is very sandy and loose on the surface. Rock is uncommon on the surface and within the profile. A compaction layer is present about 8 inches in depth. Starting at the 200 foot stake on the study site baseline, the compaction layer is impenetrable to the soil penetrometer making effective rooting depth measurements more shallow. There are small scattered areas without litter cover and only small amounts of vegetative cover, showing signs of soil movement and loss with increased amounts of rock present.

The shrub component is quite diverse with 13 species encountered on the sampling belts. Browse is dominated by mature serviceberry, mountain big sagebrush, and true mountain mahogany. Utah serviceberry density has been relatively stable since 1992, with most fluctuations due to differences in young plants sampled. Many young plants were sampled in 1992. Mature plants are very large and not all available for use. Use has been moderate. Mountain big sagebrush also had a very large number of young plants (55% of the population) sampled in 1992. It seems that not all of these plants made it to maturity. In 1999, density declined 32%. In 2004, percent decadence was up to 35% from 17% in 1999 and 22% of the population was classified as dying. Density was down another 21% in 2004 to 1,780 plants/acre with very few young plants in the population. Use was highest in 2004 with 81% showing signs of moderate use. Cover has remained stable for sagebrush.

The herbaceous understory is diverse with crested wheatgrass and smooth brome dominating the site. They made up 47% of the grass cover in 1999 and 72% in 2004. Needle-and-thread nested frequency declined significantly between 1999 and 2004. Bulbous bluegrass was common in 1992 and 1999, but it is a short lived perennial with a low forage value. It had cover of 7 and 5% in 1992 and 1999, but it declined in 2004 to less than 1% cover. Forbs are diverse but, all forbs combined produced only 3% cover in 1992, 5% in 1995 and 4% in 2004.

### 1992 APPARENT TREND ASSESSMENT

The trend for soils appears to be in a state of decline. There are numerous signs of soil movement and there is a large active gully on the lower end of the site. The browse trend appears to be improving because of good biotic potentials (proportion of young to the population) for the key species and excellent young form class ratios, both characteristics of a growing population. The herbaceous understory appears to be stable and in

good health with nine species of grasses and 18 species of forbs. The grasses dominate, making up 83% of the herbaceous understory cover. The Desirable Components Index (see methods) rated this site as good with a score of 86. Bulbous bluegrass was excluded from the perennial grass cover because it is a short lived perennial with low forage value.

winter range condition (DC Index) - 86 (good) Mountain brush type

### 1999 TREND ASSESSMENT

Trend for soil down slightly due to a slight decline in litter cover and an increase in percent cover of bare ground. Protective ground cover is not continuous and exposed bare ground shows some signs of erosion. Trend for the key browse species, serviceberry, mountain big sagebrush, and true mountain mahogany is considered stable. Density of serviceberry and mountain big sagebrush declined but this appears to be due to a reduction in young plants sampled. Utilization of the key species is moderate to heavy, yet vigor is good and percent decadence is low. Another positive trend indicator is the decline in density of broom snakeweed, an aggressive increaser, from 3,120 in 1992 to 1,000 plants/acre in 1999. Trend for the herbaceous understory is stable for grasses and up slightly for forbs. The most abundant grass is bulbous bluegrass which provides 38% of the grass cover. Intermediate wheatgrass and smooth brome are also abundant. Together they account for 47% of the grass cover. Forbs are diverse but no species is dominant. Several forb species have increased significantly in nested frequency since 1992. Overall trend for the herbaceous understory is considered up slightly. The DCI score decreased about 10 points to 76, but is still classified as good. The decrease is due to declines in the proportion of young preferred browse plants and a slight decrease in preferred browse cover.

#### TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable for grasses and up slightly for forbs, up slightly overall (4)

winter range condition (DC Index) - 76 (good) Mountain brush type

### 2004 TREND ASSESSMENT

Trend for soil is slightly down. The relative percent of bare ground increased from 24 to 32%. Litter cover only slightly decreased, but relative cryptogam cover decreased from 7 to 2%. There are some open areas with very little protective cover. The browse trend is overall stable. The most abundant species, Utah serviceberry, saw a slight increase in density. Vigor is good, use is light to moderate, but leader growth was poor. Mountain big sagebrush is slightly down. Density decreased 21% and decadence increased to 35%. There are very few young plants to replace dying plants. True mountain mahogany density was slightly lower, but vigor was excellent as annual leader growth was very long and abundant and the plants had abundant seed. The herbaceous understory trend is stable. Nested frequency of perennial grasses declined in 2004, but that was due to the decline of bulbous bluegrass. When bulbous bluegrass is excluded, the nested frequency of perennial grasses has been stable. The differences in cover can also be attributed to the decline of bulbous bluegrass, which is a short lived perennial that has a low forage value. The only perennial forb to decline significantly since 1999 is longleaf phlox. All other perennial forbs are stable. The DCI decreased to 67 which is classified as fair to good for a mountain brush community. The decrease is due to slight declines in preferred browse cover, the proportion of young preferred browse plants, increased decadence, and slight declines in herbaceous understory cover (excluding bulbous bluegrass).

TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable for grasses and slightly down for forbs, stable overall (3)

winter range condition (DC Index) - 67 (fair to good) Mountain brush type

HERBACEOUS TRENDS --

Management unit 14 , Study no: 31

T y p e	Species	Nested Frequency			Average Cover %		
		'92	'99	'04	'92	'99	'04
G	Agropyron cristatum	72	64	76	4.77	2.73	3.55
G	Bouteloua gracilis	7	13	12	.30	.45	.31
G	Bromus inermis	143	132	113	2.80	3.42	2.09
G	Bromus tectorum (a)	2	-	-	.00	-	-
G	Carex spp.	4	1	-	.33	.03	-
G	Koeleria cristata	-	-	4	-	-	.00
G	Oryzopsis hymenoides	<sub>a</sub> -	<sub>a</sub> 8	<sub>b</sub> 29	-	.15	.28
G	Poa bulbosa	<sub>b</sub> 165	<sub>b</sub> 175	<sub>a</sub> 29	6.51	5.01	.54
G	Poa fendleriana	13	8	16	.27	.06	.48
G	Sitanion hystrix	3	-	2	.00	-	.03
G	Stipa comata	<sub>b</sub> 74	<sub>b</sub> 61	<sub>a</sub> 31	1.29	1.23	.57
G	Vulpia octoflora (a)	-	6	-	-	.01	-
Total for Annual Grasses		2	6	0	0.00	0.00	0
Total for Perennial Grasses		481	462	312	16.29	13.09	7.88
Total for Grasses		483	468	312	16.29	13.10	7.88
F	Castilleja linariaefolia	6	4	-	.04	.04	-
F	Calochortus nuttallii	-	3	-	-	.00	-
F	Chaenactis douglasii	<sub>b</sub> 67	<sub>a</sub> 28	<sub>a</sub> 21	1.34	.34	.38
F	Cirsium spp.	-	1	2	-	.03	.03
F	Comandra pallida	<sub>a</sub> 35	<sub>b</sub> 64	<sub>ab</sub> 56	.14	1.09	.55
F	Collinsia parviflora (a)	-	4	-	-	.03	-
F	Cordylanthus spp. (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 23	-	-	.32
F	Crepis acuminata	3	6	-	.00	.01	-
F	Epilobium brachycarpum (a)	-	3	-	-	.18	-
F	Eriogonum alatum	-	-	2	-	-	.03
F	Eriogonum racemosum	52	57	41	.84	.57	.27
F	Eriogonum umbellatum	5	16	5	.03	.17	.07
F	Heterotheca villosa	-	1	-	-	.03	-
F	Hymenoxys acaulis	<sub>a</sub> 9	<sub>b</sub> 26	<sub>ab</sub> 22	.10	.19	.15
F	Lesquerella rectipes	<sub>b</sub> 67	<sub>b</sub> 80	<sub>a</sub> 92	.26	.25	1.43

T y p e	Species	Nested Frequency			Average Cover %		
		'92	'99	'04	'92	'99	'04
		F	Lomatium spp.	a <sup>3</sup>	b <sup>34</sup>	a <sup>2</sup>	.06
F	Lupinus sericeus	3	12	9	.03	.31	.09
F	Machaeranthera canescens	7	21	9	.01	.04	.05
F	Penstemon comarrhenus	b <sup>17</sup>	ab <sup>8</sup>	a <sup>3</sup>	.06	.04	.03
F	Phlox longifolia	a <sup>26</sup>	b <sup>53</sup>	a <sup>6</sup>	.10	.14	.07
F	Polygonum douglasii (a)	b <sup>38</sup>	a <sup>5</sup>	a <sup>-</sup>	.11	.01	-
F	Senecio multilobatus	a <sup>14</sup>	b <sup>60</sup>	b <sup>63</sup>	.12	.75	.82
F	Sphaeralcea coccinea	b <sup>17</sup>	a <sup>1</sup>	a <sup>2</sup>	.06	.00	.00
F	Zigadenus paniculatus	-	3	-	.00	.03	-
Total for Annual Forbs		38	12	23	0.11	0.21	0.32
Total for Perennial Forbs		331	478	335	3.24	4.66	4.00
Total for Forbs		369	490	358	3.36	4.88	4.32

Values with different subscript letters are significantly different at alpha = 0.10

#### BROWSE TRENDS --

Management unit 14 , Study no: 31

T y p e	Species	Strip Frequency			Average Cover %		
		'92	'99	'04	'92	'99	'04
		B	Amelanchier utahensis	25	24	28	11.52
B	Artemisia nova	0	0	5	-	-	.01
B	Arctostaphylos patula	2	4	3	2.96	4.88	5.66
B	Artemisia tridentata vaseyana	55	57	47	5.14	4.48	4.49
B	Cercocarpus montanus	11	14	11	4.82	4.77	5.21
B	Chrysothamnus depressus	14	8	11	.69	.23	.71
B	Coryphantha vivipara arizonica	0	1	0	.00	.00	-
B	Gutierrezia sarothrae	51	21	33	.98	.16	.93
B	Juniperus osteosperma	1	1	1	.03	.15	.18
B	Opuntia spp.	14	4	4	.06	.01	-
B	Pediocactus simpsonii	0	1	0	-	-	-
B	Pinus edulis	4	3	6	3.40	2.97	3.74
B	Purshia tridentata	1	0	1	.15	.00	.00
B	Symphoricarpos oreophilus	5	2	8	.15	.15	1.31
Total for Browse		183	140	158	29.93	25.94	29.62

CANOPY COVER, LINE INTERCEPT --  
 Management unit 14 , Study no: 31

Species	Percent Cover	
	'99	'04
Amelanchier utahensis	2.00	13.18
Arctostaphylos patula	-	5.91
Artemisia tridentata vaseyana	-	6.78
Cercocarpus montanus	3.40	8.31
Chrysothamnus depressus	-	.18
Gutierrezia sarothrae	-	.90
Juniperus osteosperma	.80	-
Opuntia spp.	-	.20
Pinus edulis	4.59	5.61
Pinus ponderosa	-	.03
Purshia tridentata	-	.75
Quercus gambelii	1.00	1.00
Symphoricarpos oreophilus	-	1.83

KEY BROWSE ANNUAL LEADER GROWTH --  
 Management unit 14 , Study no: 31

Species	Average leader growth (in)
	'04
Amelanchier utahensis	1.9
Artemisia tridentata vaseyana	1.8
Cercocarpus montanus	4.3

POINT-QUARTER TREE DATA --  
 Management unit 14 , Study no: 31

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	29	-
Pinus edulis	33	-
Quercus gambelii	20	-

Average diameter (in)	
'99	'04
8.5	-
5.0	-
2.0	-

BASIC COVER --

Management unit 14 , Study no: 31

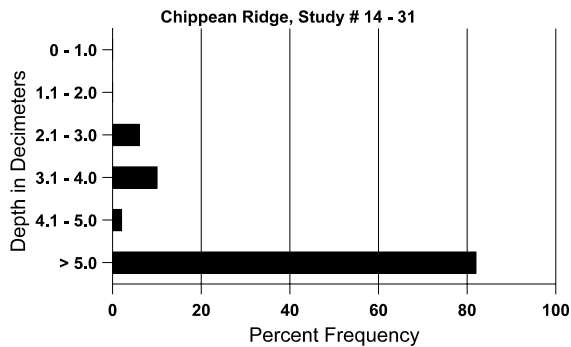
Cover Type	Average Cover %		
	'92	'99	'04
Vegetation	41.22	40.61	43.33
Rock	.49	.26	1.17
Pavement	0	.12	.08
Litter	43.40	40.94	39.56
Cryptogams	6.87	8.56	2.98
Bare Ground	22.28	29.17	40.18

SOIL ANALYSIS DATA --

Management unit 14, Study no: 31, Study Name: Chippean Ridge

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
24.7	58.4 (15.1)	7.2	57.6	17.8	24.6	1.2	4.1	102.4	0.7

Stoniness Index



PELLET GROUP DATA --

Management unit 14 , Study no: 31

Type	Quadrat Frequency		
	'92	'99	'04
Rabbit	15	34	15
Elk	1	3	7
Deer	10	6	4
Cattle	-	2	-

Days use per acre (ha)	
'99	'04
-	-
24 (59)	23 (58)
7 (17)	5 (12)
4 (10)	2 (4)

BROWSE CHARACTERISTICS --  
Management unit 14 , Study no: 31

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<b>Amelanchier utahensis</b>												
92	<b>1280</b>	340	700	580	-	-	41	5	0	-	0	-/-
99	<b>680</b>	180	180	500	-	-	6	56	0	-	0	64/87
04	<b>880</b>	-	260	580	40	-	32	9	5	2	2	59/71
<b>Artemisia nova</b>												
92	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
04	<b>200</b>	-	-	40	160	-	70	20	80	40	40	11/21
<b>Arctostaphylos patula</b>												
92	<b>40</b>	-	-	40	-	-	0	0	-	-	0	-/-
99	<b>80</b>	-	20	60	-	-	0	0	-	-	0	44/143
04	<b>60</b>	-	-	60	-	-	0	0	-	-	0	30/89
<b>Artemisia tridentata vaseyana</b>												
92	<b>3300</b>	20	1800	1320	180	-	55	19	5	2	5	-/-
99	<b>2240</b>	40	220	1640	380	300	21	13	17	5	5	18/27
04	<b>1780</b>	-	100	1060	620	260	81	3	35	22	22	17/27
<b>Cercocarpus montanus</b>												
92	<b>240</b>	180	80	160	-	-	58	8	-	-	0	-/-
99	<b>320</b>	60	80	240	-	-	44	6	-	-	0	66/73
04	<b>240</b>	-	-	240	-	-	50	0	-	-	0	65/61
<b>Chrysothamnus depressus</b>												
92	<b>680</b>	20	240	440	-	-	21	0	0	-	0	-/-
99	<b>420</b>	-	20	340	60	-	0	10	14	14	14	7/15
04	<b>620</b>	-	-	540	80	-	6	0	13	3	6	7/12
<b>Cowania mexicana stansburiana</b>												
92	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	43/42
<b>Coryphantha vivipara arizonica</b>												
92	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>20</b>	-	-	20	-	-	0	0	-	-	0	2/3
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	3/4

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Gutierrezia sarothrae</i>												
92	<b>3120</b>	-	140	2960	20	-	0	0	1	.64	.64	-/-
99	<b>1000</b>	240	620	380	-	-	4	0	0	-	0	5/5
04	<b>2540</b>	-	20	2500	20	-	0	0	1	-	0	7/10
<i>Juniperus osteosperma</i>												
92	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
99	<b>20</b>	40	20	-	-	-	0	0	-	-	0	-/-
04	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
<i>Opuntia spp.</i>												
92	<b>400</b>	-	220	160	20	-	0	0	5	5	5	-/-
99	<b>140</b>	-	40	80	20	-	0	0	14	-	29	3/7
04	<b>80</b>	-	20	40	20	-	0	0	25	25	25	3/10
<i>Pediocactus simpsonii</i>												
92	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>20</b>	-	-	20	-	-	0	0	-	-	0	3/5
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<i>Pinus edulis</i>												
92	<b>80</b>	-	20	60	-	-	0	0	-	-	0	-/-
99	<b>60</b>	40	20	40	-	-	0	0	-	-	0	-/-
04	<b>180</b>	40	140	40	-	-	0	0	-	-	0	-/-
<i>Purshia tridentata</i>												
92	<b>20</b>	-	20	-	-	-	100	0	-	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>40</b>	-	-	40	-	-	0	100	-	-	0	18/42
<i>Quercus gambelii</i>												
92	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>0</b>	20	-	-	-	-	0	0	-	-	0	28/25
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	34/22
<i>Symphoricarpos oreophilus</i>												
92	<b>160</b>	40	100	60	-	-	13	0	-	-	0	-/-
99	<b>40</b>	-	40	-	-	-	0	0	-	-	0	31/47
04	<b>480</b>	-	80	400	-	-	4	0	-	-	0	11/20